Patent Claims

1. Apparatus for the treatment of disc-shaped substrates, especially semi-conductor wafers, with a device for the rotation of the substrates about an axis of rotation (A) and at least one first group (40; 60; 80) of nozzles, whereby the nozzles are differently spaced relative to the axis of rotation (A), characterized in that the nozzles can be controlled individually or in sub groups.

2. Apparatus according to claim 1, characterized by at least one further group (44, 48; 62; 82) of nozzles, whereby the nozzles are differently spaced relative to the axis of rotation (A).

3. Apparatus according to claim 2, characterized in that the nozzles of the further group (44, 48; 62; 82) can be controlled individually or in sub groups.

4. Apparatus according to claim 2 or 3, characterized in that three groups (40, 44, 48) are provided.

5. Apparatus according to one of the claims 2 to 4, characterized in that nozzles of at least one further group (44, 48, 62; 82) are, with regard to the spacing relative to the axis of rotation (A), offset relative to the nozzles of the first group (40; 60; 80).

6. Apparatus according to one of the preceding claims, characterized in that nozzles of at least one group (40, 44, 48; 60, 62; 80) are disposed along a straight line that extends radially relative to the axis of rotation (A).

7. Apparatus according to claim 6, characterized in that the nozzles of at least two groups (44, 48; 60, 62; 80, 82) are disposed along a common straight line.

8. Apparatus according to claim 7, characterized in that the nozzles of one group (44, 48; 60, 62; 80, 82) are disposed between the nozzles of the other group (48, 44; 62, 60; 82, 80).

9. Apparatus according to one of the preceding claims, characterized in that the nozzles of at least one group (40, 44, 48; 60, 62; 80, 82) can be supplied with fluid via a common fluid supply unit.

10. Apparatus according to claim 9, characterized in that the nozzles of at least one group (40, 44, 48; 60, 62; 80, 82) can be supplied with fluid via a common pressure line.

11. Apparatus according to one of the preceding claims, characterized in that the nozzles of at least one group (40, 44, 48; 60, 62; 80, 82) can be supplied with different fluids.

12. Apparatus according to one of the preceding claims, characterized in that the nozzles of at least one group can be activated or deactivated individually or in sub groups.

13. Apparatus according to one of the preceding claims, characterized in that the shape of the nozzle stream and/or the flow volume of at least one nozzle of at least one group (40, 44, 48; 60, 62; 80, 82) can be varied.

14. Apparatus according to one of the preceding claims, characterized in that a nozzle (52) is disposed on or in the region of the axis of rotation (A).

15. Apparatus according to claim 14, characterized in that the nozzle can be supplied with different fluids.

16. Apparatus according to claim 15, characterized by at least two separate supply lines for different fluids.

17. Apparatus according to one of the preceding claims, characterized in that respectively at least one group (40, 44, 48; 60, 62; 80, 82) of nozzles is provided above and below the substrate.

18. Apparatus according to one of the preceding claims in combination with an apparatus according to one of the claims 31 to 43.

19. Method for the treatment of disc-shaped substrates, especially semiconductor wafers, according to which the substrates are rotated about an axis of rotation that is disposed essentially perpendicular to the plane of the substrates, and via at least one first group of nozzles, which are differently spaced relative to the axis of rotation, a first fluid is applied, characterized in that the

nozzles are controlled individually or in sub groups to achieve a selective treatment of surface regions of the substrate.

20. Method according to claim 19, characterized in that for the termination of the treatment with the first fluid, at least one further fluid is conducted onto the substrate via at least one nozzle.

21. Method according to claim 20, characterized in that a further fluid is conducted onto the substrate via at least one nozzle of at least one further group of nozzles.

22. Method according to one of the claims 20 or 21, characterized in that at least one fluid is applied via a nozzle that is disposed closer to the axis of rotation than is a nozzle via which the first fluid is applied to the substrate.

23. Method according to claim 20, characterized in that nozzles that apply the first fluid are deactivated sequentially in a direction away from the axis of rotation or are switched over to the application of the second fluid.

24. Method according to claim 21 or 22, characterized in that nozzles that apply the further fluid are activated sequentially in a direction away from the axis of rotation.

25. Method according to one of the claims 20 to 24, characterized in that the further fluid is applied to the substrate in the region of the axis of rotation.

26. Method according to one of the claims 19 to 25, characterized in that the treatment with the further fluid is terminated by applying a yet further fluid in the same manner as is the treatment with the first fluid.

27. Method according to one of the claims 19 to 26, characterized in that the first fluid is a treatment, cleaning, or rinsing liquid.

28. Method according to one of the claims 20 to 27, characterized in that at least one further fluid is a rinsing liquid.

29. Method according to one of the claims 20 to 38, characterized in that at least one further fluid is a fluid that reduces the surface tension of the fluid found on the substrate.

30. Method according to one of the claims 19 to 29, characterized by a simultaneous treatment of the upper side and the under side of the substrate.

31. Apparatus for the treatment of disc-shaped substrates (3), especially semiconductor wafers, with an essentially planar carrier ring (5) that is rotatable about an axis of rotation (A) via a rotation device in the plane, characterized by at least three support elements (8) that extend out of the plane of the carrier ring (5) and that form a multi-point support for the substrate (3) at a distance from the plane of the carrier ring (5).

32. Apparatus according to claim 31, characterized in that support surfaces of the support elements (8) are disposed along a peripheral contour of the substrate (3).

33. Apparatus according to claim 31 or 32, characterized in that the support elements extend into the region of a central opening (6) of the carrier ring (5).

34. Apparatus according to one of the claims 31 to 33, characterized in that the support elements (8) extend from the inner periphery of the carrier ring (5).

35. Apparatus according to one of the claims 31 to 34, characterized in that the support elements (8) extend at an incline relative to the plane of the carrier ring (5).

36. Apparatus according to one of the claims 31 to 35, characterized in that the support surfaces (12) of the support elements (8) are inclined relative to the plane of the carrier ring (5).

37. Apparatus according to one of the claims 31 to 36, characterized by at least two stop surfaces (20), which extend essentially perpendicular to the plane of the carrier ring (5), for limiting a lateral movement of the substrate (3).

38. Apparatus according to claim 37, characterized in that the stop surfaces (20) are formed on the support elements (8).

39. Apparatus according to claim 37, characterized in that the stop surfaces are provided on stop elements (27) that are provided separately from the support elements (8).

40. Apparatus according to claim 39, characterized in that the stop elements (27) are movably disposed on the carrier ring (5) and are movable between a free position and a position contacting the substrate (3).

41. Apparatus according to claim 39 or 40, characterized in that the stop elements (27) are movable into contact with the substrate (3) by a rotational movement of the carrier ring.

42. Apparatus according to one of the claims 37 to 41, characterized in that the stop elements (27) have a cross-section that widens in an essentially V-shaped manner from the stop surfaces.

43. Apparatus according to one of the claims 31 to 42, characterized in that the carrier ring (5) and the rotation device associated therewith, are disposed below the support surfaces of the support elements (8).